

## REMARKS

Claims 1-3, 9-21 and 25-32 are pending in this application. By this Amendment, claims 4-8 and 22-24 are cancelled without prejudice or disclaimer, claims 1, 2 and 12-14 are amended and claims 25-32 are added. Support for new claims 25-32 can be found in the original specification including the claims and figures, for example, see Figs. 6 and 7 and the text related thereto. Reconsideration in view of the above amendments and following remarks is respectfully requested.

### 1. 35 U.S.C. §102 Rejections

#### A. *Kwon et al.*

Claims 1-3, 9-12 and 19-21 are rejected under 35 U.S.C. §102(e) as being anticipated by *Kwon et al.* (U.S. Patent No. 6,653,988, hereinafter referred to as "*Kwon*"). The rejection is respectfully traversed.

Claim 1 recites an inductively coupled plasma (ICP) generating apparatus which comprises an evacuated reaction chamber; an antenna installed at an upper portion of the reaction chamber to induce an electric field for ionizing reaction gas supplied into the reaction chamber and generating plasma; and a radio frequency (RF) power source connected to the antenna to apply radio frequency power to the antenna, wherein the antenna comprises a plurality of coils comprising a first continuous serpentine coil and a second continuous circular coil, wherein the serpentine coil is bent in a zigzag pattern and surrounds the circular coil.

*Kwon* discloses a whirl antenna with a metal plate 130 installed over and apart from the whirl antenna. See Figs 2a and 2b and col. 3, lines 29-34. However, *Kwon* fails to disclose or suggest, as recited in claim 1, at least the feature of a

plurality of coils comprising a first continuous serpentine coil and a second continuous circular coil, wherein the serpentine coil is bent in a zigzag pattern and surrounds the circular coil. Rather, several antenna units Z1 to Z8 form a whirl with a metal plate 130 installed over and apart from the whirl antennas. See col. 2, lines 47-56 and col. 3, lines 29-33.

For at least the reasons set forth above, Applicants respectfully submit that claim 1 is allowable. Claims 2, 3 and 9-21 depend from claim 1, and are allowable for at least the same reasons, as well as their added features and the combinations thereof. Withdrawal of the rejection is respectfully requested.

**B. Wang et al.**

Claims 1-3 and 9-12 are rejected under 35 U.S.C. §102(e) as being anticipated by *Wang et al.* (U.S. Patent Publication No. 2003/0111181, hereinafter referred to as "*Wang*"). The rejection is respectfully traversed.

*Wang* discloses, an inductive antenna over plasma reactor, as illustrated in Fig. 1, with two adjacent loops 260 that appear to merge in a single current path (although, in Fig. 1, their conductors do not touch). See page 3, paragraphs [0029]. Additionally, as illustrated in Fig. 6, a conductor 605 defines a number of equally spaced triangular loops 610a, 610c, 610e, separated by three triangular sections 610b, 610d, 610f, each of the adjoining sections having a magnetic polarity opposite to that of the adjacent triangular loops. See page 4, paragraph [0040].

However, *Wang* fails to disclose or suggest all the features of claim 1, as mentioned above with respect to *Kwon*. Specifically, *Wang* fails to disclose or suggest at least the features of an antenna which comprises a plurality of coils comprising a first continuous serpentine coil and a second continuous circular coil,

wherein the serpentine coil is bent in a zigzag pattern and surrounds the circular coil. Rather, in Fig. 1 of *Wang*, two adjacent loops 260 form an inner circular path 210 and an outer circular path 220, but the single conductor 205 has half a length of the conductor extending clockwise alternating between the inner and outer circular path 210, 220 by passing through the radial path 230. See page 3, paragraph [0027]. Additionally, the clock-wise extending half of the conductor 205 terminates at the radial path 230a, where the conductor reverses direction so that its second half extends counter-clockwise from the radial path 230a. See page, paragraph [0027]. Thus, *Wang* also fails to disclose or suggest all of the features of claim 1.

For at least the reasons set forth above, Applicants respectfully submit that claim 1 is allowable. Claims 2, 3 and 9-12 depend from claim 1, and are allowable for at least the same reasons, as well as their added features and the combinations thereof. Withdrawal of the rejection is respectfully requested.

## **2. 35 U.S.C. §103 Rejections**

Claims 13-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Kwon* and *Wang*. Claims 15-18 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Kwon* in view of *Hemker et al.* (U.S. Patent Publication No. 2004/0011467, hereinafter referred to as "*Hemker*") or *Bailey, III et al.* (U.S. Patent Publication No. 2003/0010454, hereinafter referred to as "*Bailey*"), and *Wang* in view of *Hemker* or *Bailey*. Claims 19-21 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Wang* and further in view of *Kwon*. Because *Hemker* and/or *Bailey* fail to cure the deficiencies of *Kwon* and/or *Wang*, the rejection is respectfully traversed.

Claims 13-21 depend from claim 1, therefore for at least the reasons set forth above, *Kwon* and/or *Wang* fail to disclose or suggest all of the features of claim 1, from which claims 13-21 depend.

*Hemker* fails to cure the deficiencies of *Kwon* and/or *Wang*. *Hemker* discloses a plasma processing system which includes an RF antenna arrangement 102 which can have a 3-D, stock configuration, a planar spiral coil, as illustrated in Fig. 3B, a different number of loops, each of which may have a different thickness, as illustrated in Fig. 3C, a different number of loops arranged vertically, as illustrated in Fig. 3D, multiple individually driven antennas as illustrated in Fig. 3E, and/or a domed antenna, which may be a single coil as shown in Fig. 3F or may involve multiple coils driven together or with a plurality of independent supplies. See page 5, paragraph [0058] and Figs. 3B to 3F. However, *Hemker* fails to disclose or suggest the combination of features of claim 1, including at least the features also missing from *Kwon* and *Wang*.

Similarly, *Bailey* fails to cure the deficiencies of *Kwon* and *Wang*. *Bailey* discloses a plasma confinement arrangement which includes an antenna arrangement 304 that is coupled to a first RF power supply 306 via a matching network 307. However, *Bailey* fails to disclose or suggest at least the features mentioned above missing from *Kwon* and *Wang* and claim 1.

For at least the reasons set forth above, Applicants respectfully submit that claims 13-21 are allowable for at least the same reasons as claim 1. Withdrawal of the rejection is respectfully requested.

**3. New Claims**

New claims 25-32 have been added to the application. Applicants submit that the newly added claims are allowable over the references of record.

**4. Conclusion**

In light of the foregoing, Applicants respectfully request reconsideration and allowance of claims 1-3, 9-21 and 25-32.

Applicants respectfully request issuance of a Notice of Allowance. Should any residual issues exist, the Examiner is invited to contact the undersigned at the number listed below.

It is believed that this Response requires no fee. However, if a fee is required for any reason, the Commissioner is hereby authorized to charge Deposit Account No. 02-4800 the necessary amount.

Respectfully submitted,

BUCHANAN INGERSOLL PC

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By: 

Laura L. Lee

Registration No. 48,752

P.O. Box 1404  
Alexandria, Virginia 22313-1404  
(703) 836-6620